OFFICE OF COAST SURVEY

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION • UNITED STATES DEPARTMENT OF COMMERCE

The Office of Coast Survey (OCS) manages NOAA's nautical charting and data collection and information programs. OCS manages an integrated suite of programs in hydrography and cartography to help protect life and property, support economic growth and development, and protect the environment in support of the overall mission to promote safe navigation. OCS is responsible for charting U.S. and territorial waters to the limits of the Exclusive Economic Zone, an area of about 3.4 million square nautical miles.

Part of NOAA's National Ocean Service, OCS is the oldest U.S. scientific organization. Since its birth as a nation, the U.S. has depended on marine transportation to move goods, services and people. Reducing the risk of marine accidents by providing navigation services has been a fundamental federal responsibility since Thomas Jefferson mandated that there be a Survey of the Coast in 1807 in order to support our new nation's economy in a safe, efficient manner.

Accurate, reliable, and up-to-date nautical chart information is more important today than at any time in the past. Waterway usage and congestion are growing, and the U.S. economy is increasingly dependent on the global economy. As margins of safety narrow, consequences loom larger as cargo capacities are pushed to the limit. The U.S. Marine Transportation System (MTS) is critical to both economic and national security. The economy—the foundation of our national security—depends upon the unimpeded flow of commerce into and out of our ports, particularly as 95 percent of U.S. foreign trade enters and leaves by ship. The U.S. military also relies on the MTS for national defense and deployment missions.

Without adequate information, navigating the nation's waterways is like maneuvering through unmapped minefields; a mariner can only guess at what lies beneath and hope for the best. About 75 percent of all commercial vessel accidents are attributed to human error, which indicates the importance of putting up-to-date safety information in the hands of mariners. NOAA's advanced navigation information tools seek to reduce human error by providing more accurate real-time data and supporting automated advanced warning systems. Coast Survey's nautical charts, hydrographic surveys and other navigation products help to eliminate the guesswork in navigation and support a safe and profitable MTS.

Office of Coast Survey Components

- The Coast Survey Development Laboratory explores and develops new and efficient techniques to improve charting and hydrographic operations.
- The Hydrographic Surveys Division directs NOAA hydrographic survey units and conducts hydrographic survey operations.
- The Marine Chart Division acquires data from a multitude of sources to maintain the Nautical Charting Database for nautical charts and products.
- The Navigation Services Division works with users face-to-face on charting issues, conducts fast-response hydrographic surveys after waterway incidents and to validate nautical charts, and maintains the Coast Pilot, a supplemental aid to the nautical chart. (http://www.nauticalcharts.noaa.gov)

NOAA's Primary Navigation Tools

Safe navigation is a challenge on a clear day. Just imagine the added difficulty of navigating at night, in storms, or on foggy, low-visibility days. Mariners require up-to-date water depths and shoreline information, as well as information on light and buoy aid locations. They also need to know traffic separation schemes and where caution is necessary in order to avoid other ships and hidden obstructions in the water, such as wrecks, rocks, bridges, cables, or pipelines.

The Nautical Chart: Much like a road map, nautical charts portray the fundamental elements necessary to navigate in the marine environment. Traditionally paper, more recently raster (a digital picture of the paper chart), NOAA's nautical charts have now evolved into a third format—the Electronic Navigational Chart (ENC). The ENC is a "smart chart" that gives the user much more information than the paper chart can, and with much greater accuracy. ENCs are a database of vector chart features and hydrographic data used by an electronic navigation system to draw a display that resembles a nautical chart, but has greatly enhanced functionality as an advanced warning system. The NOAA ENC can be integrated with Global Positioning System satellite data and other sensor information such as radar, water levels, winds and weather to enhance situational awareness and help to make informed, safe decisions in all weather conditions. Available for free on the Internet, NOAA ENCs are designed to meet the increasingly sophisticated technological demands of mariners.

Hydrographic surveying: Coast Survey, with NOAA's

(continued on next page)

(continued from previous page)

Office of Marine and Aviation Operations, performs hydrographic surveys of U.S. coastal and territorial waters. Multi-beam and side-scan sonar systems precisely determine water depths and submerged dangers to navigation. This data is the backbone of the ENC. NOAA locates obstructions such as wrecks, rocks, seabed changes due to earthquakes and storms, and other features to update nautical charts, warn the mariner of dangers, and support port and homeland security.

Marine models and forecasts: Coast Survey researches and develops marine models and software to promote safe navigation and improve efficiencies in the Marine Transportation System.

Forecasts of water levels and conditions allow the mariner to time port arrivals and exits to coincide with the best, or deepest, water. These forecasts also allow mariners to more efficiently load vessels with cargo. NOAA's accurate and timely navigation information translates into cost savings with more efficient ship routing and transit timing, and safer entry to and exit from ports.

Navigation response teams: The Coast Survey Navigation Response Teams respond quickly to survey needs created by storm events, accidents and other special circumstances. The field teams conduct hazardous obstruction surveys utilizing diving operations, verify ENC data collection, and support other mapping capabilities.

For more information, visit *http://www.nauticalcharts.noaa.gov*